Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-232 (cancelled)

233. (currently amended A scanhead for use with an ultrasound imaging system, comprising:

a transducer assembly comprising a single element ultrasonic transducer that is configured to generate ultrasound at a frequency of at least 20 megahertz (20MHz), to transmit at least a portion of the generated ultrasound into a subject and to receive ultrasound energy from the subject;

an elongate member having a proximal end, wherein the elongate member is configured to pivot about a pivot axis spaced from the proximal end, and wherein the transducer assembly is non-rotatably coupled to the proximal end of the elongate member; ~~and~~

a means for oscillating the transducer along a reciprocating convex arcuate path at a frequency of at least 7.5 Hz, wherein a portion of the means for oscillating is fixed relative to the elongate member and moves along a reciprocating arcuate route remote from the reciprocating arcuate path of the transducer such that movement of the portion of the means for oscillating causes a complementary and opposite movement of the transducer, and wherein the reciprocating arcuate path of the transducer is co-planer to the reciprocating arcuate route of the portion of the means for oscillating; and

a means for sensing the spatial position of a proximal end of the portion of the means for oscillating along the reciprocating actuate route to determine the position of he transducer along its arcuate path.

234. (previously presented) The scanhead of Claim 233, wherein the transducer is a broadband transducer.

235. (previously presented) The scanhead of Claim 233, wherein the transducer assembly and at least a portion of the elongate member are located within an enclosed volume, and wherein the enclosed volume is at least partially filled with a fluid.

236. (previously presented) The scanhead of Claim 235, wherein the fluid has an impedance substantially similar to the impedance of tissue.

237. (previously presented) The scanhead of Claim 235, wherein the fluid is a glycol.

238. (previously presented) The scanhead of Claim 235, wherein the fluid is water.

239. (previously presented) The scanhead of Claim 235, wherein the fluid is selected from the group consisting of: water, ethylene glycol, triethylene glycol, and light paraffin oil.

240. (previously presented) The scanhead of Claim 235, wherein the enclosed volume is partially defined by an acoustically penetrable membrane and wherein the acoustically penetrable membrane is positioned such that at least a portion of the generated ultrasound can pass therethrough the membrane before being transmitted into the subject.

241. (previously presented) The scanhead of Claim 240, wherein the acoustically penetrable membrane has a thickness of about 0.9 microns (μm) to about 60.0 microns (μm).

242. (previously presented) The scanhead of Claim 240, wherein the acoustically penetrable membrane is sealably attached to a frame member, and wherein the frame member and the membrane comprise the same material.

243. (previously presented) The scanhead of Claim 240, wherein the acoustically penetrable membrane has an acoustic impedance that is substantially the same as the acoustic impedance of the fluid.

244. (previously presented) The scanhead of Claim 240, wherein the acoustically penetrable membrane has an impedance of between about 1.0 megaRayles and 3.3 megaRayles.

245. (previously presented) The scanhead of Claim 244, wherein the acoustically penetrable membrane has an impedance of between about 1.5 megaRayles and 1.8 megaRayles.

246. (previously presented) The scanhead of Claim 240, wherein the acoustically penetrable membrane comprises a material selected from the group consisting of: polyester, polycarbonate, acrylic, thermoplastic elastomer, silicone elastomer, laytex elastomer, Surlyn® ionomer, Surlyn® 8940, Kapton®, polymethyl pentene, TPX® MX-002, TPX® 95, MX-004; Teflon®, Mylar®, polyethylene, polytetrafluoroethylene, polycarbonate, polypropylene, and polyurethane films.

247. (previously presented) The scanhead of Claim 246, wherein the polyethylene is low density polyethylene (LDPE).

248. (new) The scanhead of Claim 240, wherein at least a portion of the transducer can contact at least a portion of the interior surface of the membrane during its movement along the reciprocating arcuate path.

249. (previously presented) The scanhead of Claim 233, wherein the transducer can be moved along the reciprocating arcuate path over a distance of about 15 millimeters (mm) or less.

250. (previously presented) The scanhead of Claim 233, wherein the transducer can be moved along the reciprocating arcuate path over a distance of about 10 millimeters (mm) or less.

251. (new) The scanhead of Claim 233, wherein the transducer can be moved along the reciprocating arcuate path over an angle of about 22 degrees or less.

252. (previously presented) The scanhead of Claim 233, wherein the transducer can be moved along the reciprocating arcuate path at a frequency of at least 15Hz.

253. (previously presented) The scanhead of Claim 233, wherein the transducer can be oscillated along the reciprocating arcuate path at a frequency of at least 30 Hz.

254. (previously presented) The scanhead of Claim 233, further comprising a position encoder configured to determine the position of the transducer along its reciprocating arcuate path.

255. (previously presented) The scanhead of Claim 254, wherein the position encoder is configured such that the position of the transducer can be accurately tracked along the reciprocating arcuate path to within about 1.0 micron (μm) of the actual transducer position.

256. (previously presented) The scanhead of Claim 233, wherein the means for oscillating comprises a limited angle motor.

257. (previously presented) The scanhead of Claim 256, wherein the limited angle motor is a moving coil type torque motor.

258. (previously presented) The scanhead of Claim 256, wherein the limited angle motor can oscillate the transducer along the reciprocating arcuate path at a speed of at least about 10Hz.

259. (previously presented) The scanhead of Claim 258, wherein the limited angle motor can oscillate the transducer along the reciprocating arcuate path at a speed of at least about 15Hz.

260. (previously presented) The system of Claim 259, wherein the limited angle motor can oscillate the transducer along the reciprocating arcuate path at a speed of at least about 30Hz.

261. (previously presented) The scanhead of Claim 240, further comprising a sealing membrane that defines at least a portion of the enclosed volume.

262. (previously presented) The scanhead of Claim 261, wherein the sealing membrane is sealed relative to the elongate member at the pivot axis.

263. (previously presented) The scanhead of Claim 261, wherein the sealing membrane comprises a flexible elastomer.

264. (previously presented) The scanhead of Claim 262, wherein the sealing membrane is configured to have a reduced stretch deformation when the elongate member is oscillated within the enclosed volume.

265. (previously presented) The scanhead of Claim 261, wherein the sealable membrane comprises a flexible elastomer.

266. (previously presented) The scanhead of Claim 233, wherein the transducer is configured to generate ultrasound at a frequency of between about 25MHz and about 60MHz.

267. (previously presented) The scanhead of Claim 233, wherein the transducer is configured to generate ultrasound at a frequency of at least about 25MHz.

268. (previously presented) An ultrasound imaging system, comprising:

the scanhead of Claim 233; and

a processor configured to process the received ultrasound to provide an image having a frame rate of at least 15 frames per second (fps).

269. (previously presented) The system of Claim 268, wherein the processor is further configured to produce an ultrasound image having a spatial resolution of less than about 100 microns (μm).

270. (previously presented) The system of Claim 269, wherein the processor is further configured to produce an ultrasound image having a spatial resolution of about and between 75-100 microns (μm).

271. (previously presented) The system of Claim 269, wherein the processor is further configured to produce an ultrasound image having a spatial resolution of about and between 30-100 microns (μm).

272. (previously presented) The system of Claim 268, wherein the transducer can be oscillated along the reciprocating arcuate path at a frequency of at least 15Hz, and wherein the processor is configured to provide an image having a frame rate of at least 30 fps and a spatial resolution of less than about 100 microns (μm).

273. (previously presented) The system of Claim 268, wherein the transducer can be oscillated along the reciprocating arcuate path at a frequency of at least 30 Hz and wherein the processor is configured to provide an image having a frame rate of at least 60 fps and a spatial resolution of less than about 100 microns (μm).

274. (previously presented) The ultrasound imaging system of claim 233, wherein the scanhead is configured for extra-vascular imaging applications.

275. (previously presented) An ultrasound imaging system, comprising:

the scanhead of Claim 233;

a processor configured to process the received ultrasound to provide an image having a frame rate of at least 15 frames per second (fps); and

a means for positioning the transducer to within about 1 micron (μm) of a predetermined location along the reciprocating arcuate path.

276. (previously presented) The ultrasound imaging system of Claim 275, wherein the processor is further configured to provide a pulsed-wave Doppler image.

277. (previously presented) The ultrasound imaging system of Claim 275, wherein the processor is further configured to provide an M-Mode image.

Claims 278 – 324 are cancelled.

325. (currently amended) A method for producing an ultrasound image, comprising:

a) providing a scanhead, comprising:

i) a transducer assembly comprising a single element ultrasonic transducer;

ii) an elongate member having a proximal end, wherein the elongate member is configured to pivot about a pivot axis spaced from the proximal end, and wherein the transducer assembly is non-rotatably coupled to the proximal end of the elongate member; ~~and~~

iii) a means for oscillating the transducer along a reciprocating convex arcuate path, wherein a portion of the means for oscillating is fixed relative to the elongate member and moves along a reciprocating arcuate route remote from the reciprocating arcuate path of the transducer such that movement of the portion of the means for oscillating causes a complementary and opposite movement of the transducer, and wherein the reciprocating arcuate path of the transducer is co-planer to the reciprocating arcuate route of the portion of the means for oscillating; and

iv) a means for sensing the spatial position of a proximal end of the portion of the means for oscillating along the reciprocating actuate route to determine the position of he transducer along its arcuate path.

b) generating ultrasound at a frequency of at least about 20 megahertz (20MHz) using the transducer;

c) transmitting at least a portion of the generated ultrasound into a subject from a location external to the subject;

d) receiving ultrasound energy from the subject;

e) oscillating the transducer along the reciprocating arcuate path at a frequency of at least 7.5 Hz during the generation, transmission and receipt of the ultrasound; and

f) processing the received ultrasound to provide an image having a frame rate of at least 15 frames per second (fps).

326. (previously presented) The method of Claim 325, wherein the subject is a small animal.

327. (previously presented) The method of Claim 326, wherein the small animal is a mouse or a rat.

328. (previously presented) The method of Claim 325, wherein the subject is an embryo.

329. (previously presented) The method of Claim 325, further comprising using ultrasound in a frequency range of 20 MHz to 60MHz.

330. (previously presented) The method of Claim 325, wherein the transducer is moved along the reciprocating arcuate path at a frequency of at least 30 Hz, and wherein the provided image has a frame rate of at least 60 fps.

331. (previously presented) The method of Claim 325, wherein the position of the transducer is accurately tracked along the reciprocating arcuate path to within about 1.0 micron (μm) of the actual transducer position using a position encoder.

332. (previously presented) The method of Claim 325, further comprising positioning the transducer to within about 1 micron (µm) of a predetermined location along the reciprocating arcuate path.

333. (previously presented) The method of Claim 332, wherein the provided image is a pulsed-wave Doppler image.

334. (previously presented) The method of Claim 332, wherein the provided image an M-Mode image.

Claims 335 – 344 are cancelled.